What is claimed is:

1. A method of making a nanocomposite, said method comprising:

Providing an inorganic material, said inorganic material having a layered structure when in a dry state;

providing an emulsion comprising at least one molten polymer;

inducing nanoscale exfoliation of said inorganic material; and

combining said exfoliated inorganic material with said emulsion comprising at least one molten polymer to make said nanocomposite such that nanoscale exfoliation of said inorganic material is maintained.

2. The method of claim 1, wherein said inorganic material having a layered structure is synthetic hydrotalcite.

3. The method of claim 2, wherein said inorganic material having a layered structure is an intercalated hydrotalcite.

4. The method of claim 3, wherein said inorganic material having a layered structure is an amino-acid intercalated hydrotalcite.

5. The method of claim 4, wherein said amino-acid is selected from straight chain amino-acids, branched chain amino-acids, saturated amino-acids, unsaturated amino-acids and substituted amino-acids.

6. The method of claim 5, wherein said amino-acid is aminobutyric acid.

7. The method of claim 5, wherein said amino-acid is aminocaproic acid.

8. The method of claim 1, wherein said inorganic material having a layered structure is capable of self-exfoliation.

9. The method of claim 1, wherein said polymer is selected from polypropylene, polyethylene, polybutadiene, polystyrene, high impact polystyrene, styrene acrylonitrile, acrylonitrile-butadienestyrene, polyethylene terephthalate, polybutylene terephthalate, styrene butadiene rubber, butyl rubber, nitrobutyl rubber, polycarbonate, dynamically cross-linked thermoplastic olefin polymers, polyurethane and nylon.

10. The method of claim 1, wherein said polymer is polypropylene.

11. The method of claim 10, wherein said polypropylene is a modified polypropylene.

12. The method of claim 11, wherein said modified polypropylene is a maleated polypropylene.

13. The method of claim 11, wherein said modified polypropylene is modified with glycidyl methacrylate.

14. The method of claim 1, wherein said nanoscale exfoliation is self-exfoliation that is induced by adding said inorganic material to a solvent.

15. The method of claim 14, wherein said inorganic material and said solvent form a slurry.

16. The method of claim 14, wherein said inorganic material and said solvent form a paste.

17. The method of claim 14, wherein said solvent is water.

18. The method of claim 14, wherein said solvent is alcohol.

19. The method of claim 18, wherein said alcohol is selected from methanol, ethanol, n-propanol, i-propanol, n-butanol, i-butanol.

20. The method of claim 14, wherein said solvent is a ketone selected from acetone or methyl ethyl ketone.

21. The method of claim 1, wherein said step of combining is accomplished by an extruder.

22. A method of making a nanocomposite, said method comprising:

Providing an intercalated inorganic material having a layered structure;

providing an emulsion comprising at least one molten polymer;

inducing nanoscale exfoliation of said intercalated inorganic material; and

combining said exfoliated intercalated inorganic material with said emulsion comprising at least one molten polymer to make said nanocomposite such that nanoscale exfoliation of said inorganic material is maintained.

23. A method of making a nanocomposite, said method comprising:

Providing an intercalated synthetic hydrotalcite in the form of a slurry, suspension or paste, said intercalated synthetic hydrotalcite being exfoliated;

providing an emulsion comprising at least one molten polymer; and

combining said exfoliated intercalated synthetic hydrotalcite with said emulsion comprising at least one molten polymer to make said nanocomposite such that nanoscale exfoliation of said intercalated synthetic hydrotalcite is maintained.

24. The method of claim 23, wherein said intercalated synthetic hydrotalcite is an amino-acid intercalated hydrotalcite.

25. The method of claim 24, wherein said amino-acid is selected from straight chain amino-acids, branched chain amino-acids, saturated amino-acids, unsaturated amino-acids and substituted amino-acids.

26. The method of claim 25, wherein said amino-acid is aminobutyric acid.

27. The method of claim 25, wherein said amino-acid is aminocaproic acid.

28. The method of claim 23, wherein said polymer is selected from polypropylene, polyethylene, polybutadiene, polystyrene, high impact polystyrene, styrene acrylonitrile, acrylonitrile-butadienestyrene, polyethylene terephthalate, polybutylene terephthalate, styrene butadiene rubber, butyl rubber, nitrobutyl rubber, polycarbonate, dynamically cross-linked thermoplastic olefin polymers, polyurethane and nylon.

29. The method of claim 23, wherein said polymer is polypropylene.

30. The method of claim 29, wherein said polypropylene is a modified polypropylene.

31. The method of claim 30, wherein said modified polypropylene is a maleated polypropylene.

32. The method of claim 30, wherein said modified polypropylene is modified with glycidyl methacrylate.

33. The method of claim 23, wherein said step of combining is accomplished by an extruder.

34. A method of making a nanocomposite, said method comprising:

Providing an amino-acid intercalated inorganic material having a layered structure;

providing an emulsion of at least one molten polymer;

combining said amino-acid intercalated inorganic material with a solvent to induce nanoscale exfoliation of said amino-acid intercalated inorganic material; and

combining said exfoliated amino-acid intercalated inorganic material with said emulsion comprising at least one molten polymer to make said nanocomposite such that nanoscale exfoliation of said amino-acid intercalated inorganic material is maintained.

35. A method of making a nanocomposite, said method comprising:

Providing an inorganic material having layered structure and solvent molecules trapped in or associated within said layered structure;

providing an emulsion of at least one molten polymer;

combining said inorganic material with said molten polymer such that said combining causes rapid vaporization of said solvent molecules, causing nanoscale exfoliation of said inorganic material;

mixing said inorganic material and said polymer such that said nanoscale exfoliation of said inorganic material is maintained.

36. The method of claim 35, wherein said inorganic material is selected from the group consisting of hydrotalcites, clays and micas.

37. The method of claim 36, wherein said inorganic material is a synthetic hydrotalcite intercalated with an organic compound.

38. The method of claim 37, wherein said hydrotalcite is amino-acid intercalated hydrotalcite.

39. The method of claim 38,wherein said amino-acid is selected from straight chain amino-acids, branched chain amino-acids, saturated amino-acids, unsaturated amino-acids and substituted amino-acids.

40. The method of claim 39, wherein said amino-acid is aminobutyric acid.

41. The method of claim 39, wherein said amino-acid is aminocaproic acid.

42. The method of claim 35, wherein said polymer is selected from polypropylenes, polyethylenes, polybutadienes, polystyrenes, high impact polystyrenes, styrene acrylonitriles, acrylonitrile-butadienestyrenes, polyethylene terephthalates, polybutylene terephthalates, styrene butadiene rubbers, butyl rubbers, nitrobutyl rubbers, polycarbonates, dynamically cross-linked thermoplastic olefin polymers, polyurethanes and nylons.

43. The method of claim 35, wherein said polymer is polypropylene.

44. The method of claim 43, wherein said polypropylene is a modified polypropylene.

45. The method of claim 44, wherein said modified polypropylene is a maleated polypropylene.

46. The method of claim 44, wherein said modified polypropylene is modified with glycidyl methacrylate.

47. The method of claim 35, wherein said solvent is water.

48. The method of claim 35, wherein said solvent is alcohol.

49. The method of claim 48, wherein said alcohol is selected from methanol, ethanol, n-propanol, i-propanol, n-butanol, i-butanol.

50. The method of claim 35, wherein said solvent is a ketone selected from acetone or methyl ethyl ketone.

51. The method of claim 35, wherein said step of combining is accomplished by an extruder.